Iron (Fe) concentrations in the byssus and soft tissues of the green-lipped mussel Perna viridis (L.): Byssus as an excretion route of Fe and Fe bioavailability in the coastal waters

Abstract

Iron (Fe) in the marine mussels has been reported to play an important role in the strength of attachment of the mussels since Fe is a major element in the attachment property on the mussel byssus. However, the distribution of Fe in the green-lipped mussel Perna viridis has not been reported in the literature. In this study, the distribution of Fe in different parts of the byssus and soft tissues of Perna viridis were investigated. It was found that the attachment plaque of the byssus accumulated the highest concentration of Fe, followed by the proximal, distal, stem and root. Iron levels were determined in the byssus and soft tissues of P. viridis collected from 12 geographical sites. It was found that the Fe levels in the byssus were the highest among all the soft tissues studied. The Fe levels could be about 3-17 times higher ($P < 0.05$) in the byssus than in the different soft tissues of P. viridis. Since the byssus of blue mussel Mytilus edulis has been reported to be an excretion route for Fe, it is believed that the byssus of P. viridis is an excretion route for Fe. The Fe could be an essential metal for byssal formation and the byssus is a potential biomonitoring organ for Fe bioavailaibility in coastal waters.

Keyword: Bioavailability, Byssus, Fe, Mussel, Perna viridis